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Inedit data on neotropical Gonatopodinae, with description of a gynander specimen (Hymenoptera: Chrysidoidea: Dryinidae)

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■ **ABSTRACT.** The present paper offers information about six Neotropical Gonatopodinae. The males of *Esagonatopus angelicus* Virla and *Gonatopus fidalgoi* Virla are described, these two species were known previously only on the basis of female specimens. A key for the identification of the males of the Neotropical species of *Gonatopus* Ljungh is given. A gynander specimen of *Gonatopus desantisi* Olmi is described and the geographical distribution of this species enlarged. The hosts of *Gonatopus lauti* Virla are quoted for the first time. *Gonatopus contortus* Olmi and *G. fritzi* (Olmi) are the first species of Dryinidae known for Mendoza province (Argentina).

KEY WORDS. Dryinidae. Gonatopodinae. Neotropic Region. Gynander. Argentina.

■ **RESUMEN. Datos inéditos sobre Gonatopodinos neotropicales, con descripción de un especimen ginandromorfo (Hymenoptera: Chrysidoidea: Dryinidae).** En la presente contribución se brinda información acerca de seis gonatopodinos neotropicales. Se describen por primera vez los machos de *Esagonatopus angelicus* Virla y *Gonatopus fidalgoi* Virla, especies que eran conocidas solo a través de ejemplares hembra; se aporta una clave para la identificación de los machos de las especies neotropicales del género *Gonatopus* Ljungh. Se describe un ejemplar ginandromorfo de *Gonatopus desantisi* Olmi y se amplía la distribución geográfica de esta especie. Se mencionan por primera vez las especies que sirven de huéspedes de *Gonatopus lauti* Virla y se registra la ocurrencia de la familia Dryinidae en la provincia de Mendoza (Argentina), a través de *Gonatopus contortus* Olmi y *G. fritzi* (Olmi).

PALABRAS CLAVE. Dryinidae. Gonatopodinae. Región Neotropical. Ginandromorfo. Argentina.

INTRODUCTION

Dryinidae is a widespread family with at least 1300 species. They are exclusively parasitoids and predators of Hemiptera Auchenorrhyncha. The world revision made by Olmi (1984, 1989) produced important changes in the family taxonomy. In spite of all the taxonomic and bionomics studies carried out from 1984 to the date (Olmi, 1986, 1987a, 1987b, 1987c, 1992a, 1992b, 1992c, 1993, 1994, 1995, 1996a, 1996b, 1997; Olmi & Virla, 1993; Virla, 1997a, 1997b; Virla & Olmi, 1998) the Neotropic Dryinidae are still little know.

In the last years, the author has worked in different aspects of Dryinidae family. This permits to rear several species and identify the so different opposite sex. Regarding that these investigations give information that could be of interest for researchers related with this thematic, the aim of this work is a contribution to a better knowledge of the Dryinidae in the Neotropical Region.

MATERIAL AND METHODS

The terminology and taxonomy are those of Olmi (1984, 1989 and 1993). The following abbreviations are used: POL = distance between the posterior ocelli; OL = distance between anterior and posterior ocelli; OOL = distance between posterior ocelli and eyes; OPL = distance of the lateral ocelli from the occipital margin (ocelar–occipital line).

The specimens examined in the course of this study are deposited in the Instituto – Fundación Miguel Lillo Collection (San Miguel de Tucumán, Argentina). The specimens of *Gonatopus contortus* and *G. fritzi* from Mendoza province are deposited in the entomological collections of IADIZA (Mendoza)

In the present paper, only the left or right halves of the prosternum and male genitalia are drawn.

RESULTS

Esagonatopus Olmi
Esagonatopus angelicus Virla
(Figs. 1-5)

Esagonatopus angelicus Virla 1997a: 176

Description. Male. Fully winged; length 2.4–2.87 mm; head black, with mandibles yellow; antennae black, with segments 1-2 brown-ferruginous; thorax and propodeum black; gaster dark-brown; legs yellowish with coxae, cubs of femora and tibiae partly brown. Antennae hairy, not distally thickened; antennal segment 3 more than three times as long as broad (13:4); antennal segments in the following proportions: 5.5: 5: 5.5: 7.5: 7: 7: 7: 7: 6: 9.5. Head shiny, granulated with two shiny areas laterally, near the posterior ocelli; occiput concave; occipital carina absent; temples distinct; frontal line incomplete; POL= 6.5, OL= 2.5, OOL= 4; scutum shiny, granulated; notauli complete, posteriorly separated; minimum distance between the notauli shorter than the breadth of the ocelli (6.5:1.5); prosternum black, wide/length relation of the visible part: 22.2:14; prosternal apophysis not greatly expanded, posterior angle of the apophyseal arms ("furcal arms" *sensu* Matsuda, 1970) small (Fig. 1); scutellum and metanotum shiny, smooth, without sculpture; forewings hyaline, without dark transversal bands; stigmal cell open; distal part of stigmal vein longer than proximal part (17: 12.5) (Fig. 2); dorsal process of parameres (Fig. 3) small and narrow; maxillary palpi with 6 segments; labial palpi with 2 segments (Fig. 4); tibial spurs 1, 1, 2. Ninth abdominal sternite as in Fig. 5.

Variability. Of the studied material (four males), the only observed significant variations correspond to the total length of the body and the coloration of the legs (that can be yellowish or whitish).

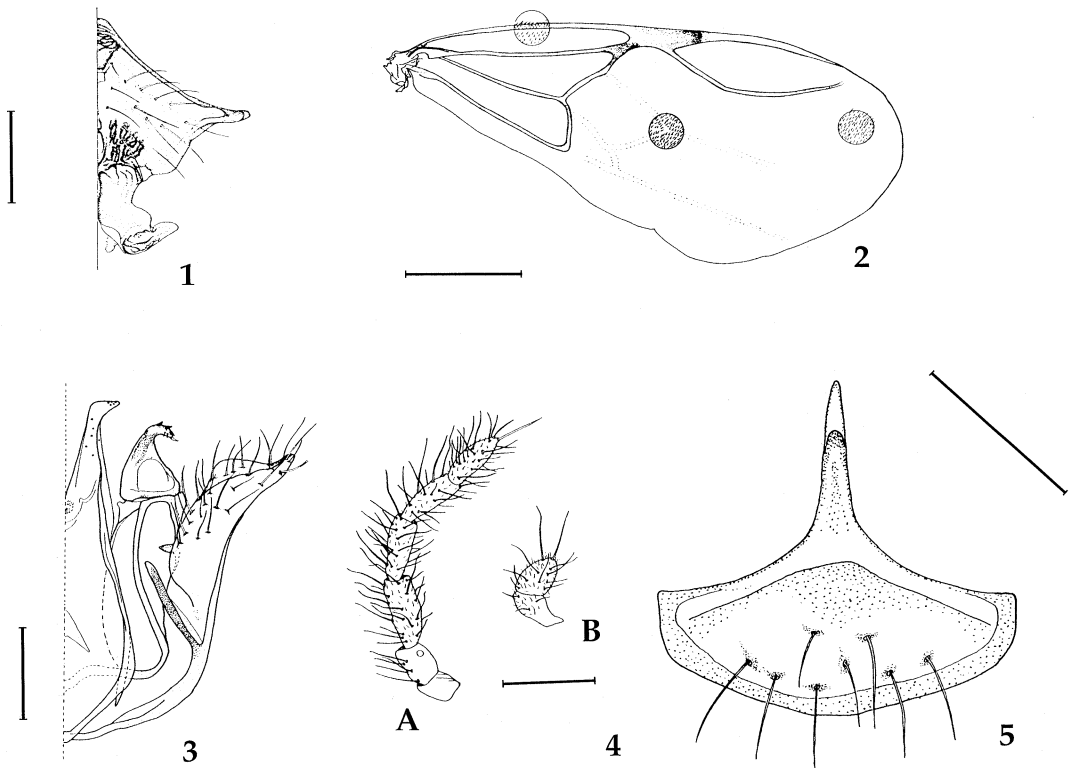
Female. After carrying out the original description, I had the possibility to study another female specimens of this species. The differences observed with regard to the holotypus are the following: length 3.78 to 4.44 mm; legs testaceous with coxae black and fore femur, tibiae and trochanter dark brown but with its apex testaceous; the proportions in the antennal segments are very similar to those of the holotypus, but not significant differences were observed in the segments II, IV and X. Head fully or slightly granulated; POL = 2.5 – 3, OL = 2, OOL = 9 – 11; pronotum shiny, granulated or slightly granulated; fore tarsal segments in the following proportions: I = 13.75 –15; II = 3; III = 4.25 – 5.5; IV = 21 – 25; V = 27.5 – 35; enlarged claw with a row of 12 to 14 lamellae + 1 peg-like hair; segment 5 of front tarsus with an external row of 18 or 19 hairs and two rows of 18 or 19 + 6 or 7 lamellae; distal apex with a group of at least 16 to 20 lamellae + 4 to 8 hairs.

Distribution. This species was known only on the basis of one female specimen collected in Loreto Exp. Station (Misiones province – Argentina) (Virla 1997a). Recent researches about parasitoids of leafhoppers and planthopper permit to examine a series of male and female specimens from Río Cuarto (Córdoba province).

Bionomics. All the specimens were bred from III, IV and V nymph of an undetermined Cicadellidae Deltocephalinae, green colored.

Material examined. ARGENTINA. Córdoba province: Río Cuarto, 4-XII-1997, E. Virla col., 4♂♂ and 6♀♀. Of this, one male and female are deposited in Olmi's collections (Viterbo, Italy).

Remarks. This is the first male known belonging *Esagonatopus* genus in the Neotropic Region.



Figs. 1-5: *Esagonatopus angelicus* Virla 1997a. **1**, prosternum; **2**, forewing; **3**, male genitalia; **4**, Palps, maxillary (A) and labial (B); **5**, ninth abdominal sternite. Scales: Figs. 1, 3, 4 and 5: 0,1 mm; Fig. 2: 0,5 mm.

Gonatopus Ljungh
Gonatopus orbitalis Cameron group
(*sensu* Olmi 1993)

Gonatopus desantisi Olmi (Fig. 6)

Gonatopus desantisi Olmi in Olmi & Virla 1993: 58

Olmi (1987a) describes the first gynander dryinid belonging *Gonatopus cavazzutii* Olmi 1987a. Studying a population of *Gonatopus desantisi*, an exceptional gynander specimen was obtained (Fig. 6).

Description of the gynander. Length 2.67 mm.; head typically of female, testaceous (with two dark spots on the right temple), excavated, shiny, weakly granulated; frontal line complete, occipital carina absent; POL = 3, OL = 2.5, OOL=11 and OPL= 7.5; temples distinct; antenna testaceus and distally thickened; antennal segments in the following proportions: 7: 5: 9.5: 5.5: 5.5 : 4.5 : 4.5 : 5 : 5.5 : 8.5; pronotum with left side testaceous and a sketch of transversal impression, right side reduced, black and granulated; scutum as the pronotum: with the left side testaceous, reduced and the right side black, granulated and shiny, with a sketch of notauli incomplete; it is a small and deformed right forewing; scutellum typically of male, shiny, smooth and without sculpture; the hind right wind is more developed; propodeum well developed, testaceous with a longitudinal black patch on right side, shiny and with some transversal striae on pleura and on posterior surface; tibial spurs 1, 1, 1; segment 5 of the right fore tarsus biggest than left one. In order to don't damage the material, it was not carried out dissections of the genitalia and the labial and maxillary palpi.

Bionomics. It was bred from a Cicadellidae Deltocephalinae nymph (perhaps *Amplicephalus* sp. or *Haldorus* sp.) captured by sweeping from wild grasses on October 20, 1997 in San Miguel de Tucumán. The duration of the pupa state was 22 days (four as prepupae) and the adult lived only 48 hs. The specimen is deposited in the Instituto – Fundación Miguel Lillo Collection.

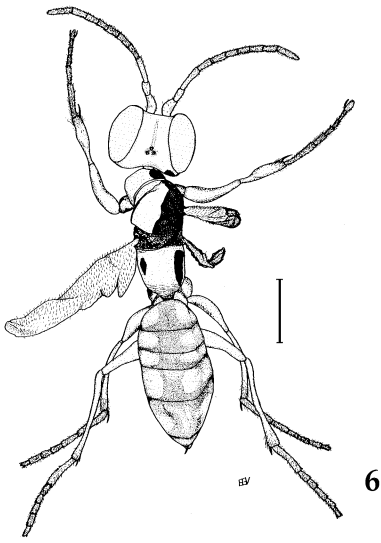


Fig. 6: *Gonatopus desantisi* Olmi 1993: gynander. Scale: 0,5 mm

Distribution. Argentina: Santa Catalina, Lag. La Bellaca (Pdo. San Vicente), La Plata (Buenos Aires province) (Olmi & Virla 1993); Temperley and Bella Vista (Buenos Aires province), San Miguel de Tucumán, Tafi del Valle (Tucumán province), Rosario de Lerma (Salta province), Recreo (Catamarca province), Dos de Mayo, Loreto (Misiones province) (Virla & Olmi, 1998), and now is enlarged to: Potrero de las Tablas (Tucumán province), Resistencia (Chaco province), Helvecia and Florencia (Santa Fe province)

Gonatopus fidalgoi Virla
(Figs. 7-9)

Gonatopus fidalgoi Virla 1997a: 183

Description. Male. Fully winged; length 2.05 mm.; head black, with mandibles testaceous; antennae brown; thorax and propodeum black; gaster brown-dark; legs testaceous, with coxae, trochanters and cubs of femora brown-dark; antennae not distally thickened, with segment 3 more than three times as long as broad (13: 3); antennal segments in the following proportions = 8: 7: 13: 17: 13: 12; 10.5: 11, 10.5; 13; head shiny, punctate, without sculpture among the punctures, hairy; frontal line absent; occipital carina absent; POL= 7, OL= 2,5, OOL= 3; region of the vertex on the sides of the posterior ocelli with lateral oval shiny areas; prosternum brown, wide/length relation of the visible part: 17.2:12.2; prosternal apophysis expanded, the furcal arms assumes elaborate shapes (Fig. 7); scutum finely punctate, without sculpture among punctures, partly very slightly granulated, hairy; notauli complete, posteriori separated; minimum distance between the notauli shorter than the breadth of the ocelli (4:7); scutellum and metanotum shiny, punctate and without sculpture among the punctures, hairy; propodeum shiny, partly reticulate and hairy; forewing hyaline, without dark transversal bands; distal part of the stigmal vein longer than proximal part (24: 12.5); dorsal process of parameres (Fig. 8) shorter than penis and parameres; dorsal process of parameres slender, with apex pointed; maxillary palpi with 4 segments; labial palpi with 2 segments; tibial spurs = 1, 1, 2. Ninth abdominal sternite as in Fig. 9.

Bionomics. Parasitoid of leafhoppers (Agallinae). After breeding this species on *Agalliana ensigera* Oman, starting from individuals coming from Tafi del Valle (Tucumán province), it was possible to obtain a male specimen, the first known for *G. fidalgoi*.

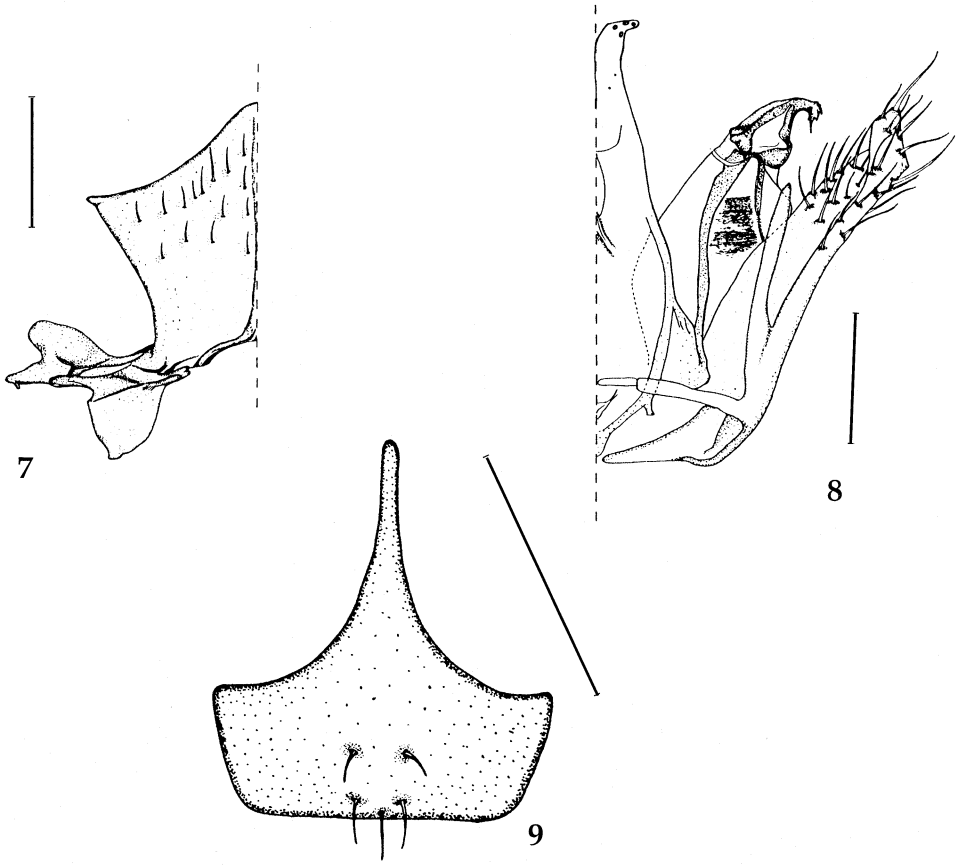
Distribution. Argentina: La Plata (Buenos Aires province), Tafi del Valle (Tucumán province), Loreto (Misiones province) (Virla 1997a).

Material examined. ARGENTINA. Tucumán province: S. M. de Tucumán, 20/V/1998, E. Virla col., 1♂ bred from *Agalliana ensigera* at CIRPON (Centro de Investigaciones sobre Regulación de las Poblaciones de Organismos Nocivos), on oats.

Remarks. The male of *G. fidalgoi* is closely related to *Gonatopus costaricanus* (Olmi, 1989) from which it may be distinguished by the antennae brown (testaceous in *G. costaricanus*), scutum shiny, reticulate and the propodeum is shiny, with posterior surface partly reticulate (meanwhile the scutum is dull, granulated, and the propodeum shiny, with posterior surface strongly rugose in *G. costaricanus*). *G. fidalgoi* have the maxillary palpi with four segments and *G. costaricanus* have only three segments.

As a consequence of the description of the male of *G. fidalgoi*, the key to the males of Neotropic *Gonatopus* published by Olmi (1989), partially modified by Olmi & Virla (1993) and Virla (1997b), has to be modified again, as follows:

1- Antennal segment 3 less than three times as long as broad 2



Figs. 7-9: *Gonatopus fidalgoi* Virla 1997a: **7**, prosternum; **8**, male genitalia; **9**, ninth abdominal sternite. Scales: 0,1 mm

- Antennal segment 3 more than three times as long as broad 4

2- Notauli incomplete; propodeum smooth and irregularly striate, not reticulate rugose, not granulated .... *Gonatopus zolnerowichi* (Olmi 1989)

- Notauli complete; propodeum reticulate rugose or granulated 3

3- Propodeum reticulate rugose; dorsal process of the parameres not reduced, not lobe shaped ..... *Labeo sanctivincenti* Ashmead 1894 (see *nomina dubia* in Olmi 1984)

- Propodeum granulated; dorsal process of the parameres reduced and lobe shaped (Fig. 5 in Olmi & Virla 1993) .... *Gonatopus caraibicus* (Olmi 1986)

4- Propodeum fully reticulate rugose 5

- Propodeum at most partly reticulate rugose, fully or partly smooth, occasionally rugose or fully granulated 16

5- Dorsal process of the parameres longer than penis 6

- Dorsal process of the parameres shorter than penis 7

6- Distal and lateral margins of dorsal process of the parameres without papillae; basis of dorsal process of the parameres narrow .... *Laberinus paranensis* Ogloblin 1932 (see *nomina dubia* in Olmi 1984)

- Distal and lateral margins of dorsal process of the parameres with papillae; basis of dorsal process of the parameres broad .... *Gonatopus vidanoi* Olmi 1994

7- Dorsal process of the parameres with apex pointed 8

- Dorsal process of the parameres with apex broadened 13

8- Notauli posteriorly joint 9

- Notauli posteriorly separated 10

9- Dorsal process of the parameres very slender ..... *Gonatopus flavoides* (Olmi 1984)

- Dorsal process of the parameres broad and with inner margin serrate .... *Gonatopus krombeini* Olmi 1997

10- Head almost fully testaceous, except for vertex darkened ..... *Gonatopus neotropicus* (Olmi 1986)

- Head black, with mandibles testaceous 11

11- Dorsal process of the parameres much shorter than the parameres and with median region broadened ..... *Gonatopus flavipes* Olmi 1984

- Dorsal process of the parameres slender, approximately as long as parameres 12

12- Labial palpi with 3 segments ..... *Gonatopus arnaudi* (Olmi 1984) (see also *Gonatopus ravidanus* (Olmi 1986))

- Labial palpi with 2 segments ..... *Gonatopus chilensis* (Olmi 1989)

13- Labial palpi with 2 segments ..... *Gonatopus lacualis* Olmi 1984

- Labial palpi with 3 segments 14

14- Dorsal process of the parameres with apex slightly broadened ..... *Gonatopus tijucanus* (Arlé 1935)

- Dorsal process of the parameres very broadened 15

15- Vertex of head with an oval shiny area between posterior ocelli and eyes; dorsal process of the parameres with proximal region very slender ..... *Gonatopus virlai* Olmi 1993

- Vertex of head without an oval shiny area between posterior ocelli and eyes; dorsal process of the parameres with proximal region not slender ..... *Labeo grenadensis* Ashmead 1900 (see *nomina dubia* in Olmi 1984)

16- Notauli complete 17

- Notauli incomplete 23

17- Dorsal process of parameres shorter than parameres 18

- Dorsal process of parameres approximately as long as, or longer than parameres 21

18- Distal apex of the dorsal process of parameres broadened 19

- Distal apex of the dorsal process of parameres slender (Fig. 8) 20

19- Dorsal process of parameres transverse; anterior ocellus approximately 1,5-2,0 times as broad as OOL; propodeum less smooth ..... *Gonatopus variistriatus* (Fenton 1927)

- Dorsal process of parameres not transverse; anterior ocellus approximately as broad as OOL; propodeum smoother ..... *Gonatopus desantisi* Olmi 1993

18- Scutum dull, granulated; maxillary palpi with 3 segments; antennae testaceous ..... *Gonatopus costaricanus* (Olmi 1989)

- Scutum shiny, finely punctate and without sculture among punctures, partly very slightly granulated; maxillary palpi with 4 segments; antennae brown ..... *Gonatopus fidalgoi* Virla 1997a

21- Dorsal process of parameres with distal apex slender ..... *Gonatopus lauti* Virla 1997b

- Dorsal process of parameres with distal apex broadened 22

22- Propodeum not smooth, fully weakly rugose; dorsal process of the parameres with apex slightly broadened ..... *Gonatopus bartletti* Olmi 1984

- Propodeum with dorsal surface fully smooth; posterior surface reticulate rugose; dorsal process of the parameres with apex more broadened ..... *Labeo simulans* Ashmead 1894 (see *nomina dubia* in Olmi 1984)

23- Dorsal process of the parameres much shorter than penis 24

- Dorsal process of the parameres slightly shorter than penis 25

24- Head brown-light, almost reddish; dorsal process of parameres with darked part long and narrow .... *Gonatopus fernandinae* Olmi 1984

- Head black; dorsal process of the parameres with darkened part short and broad ..... *Gonatopus sandrae* Olmi 1997

25- Legs brown-dark, with distal apex of coxae, trochanters and femora yellow; proximal apex of tibiae and tarsi yellow ..... *Gonatopus cubensis* (Richards 1969)

- Legs testaceous-dark, with distal apex of coxae, trochanters and femora slightly light; proximal apex of tibiae and tarsi slightly light ..... *Gonatopus breviforceps* Kieffer 1904

Gonatopus contortus Olmi

Gonatopus contortus Olmi 1984: 1768

Variability. Examining specimens belonging this species, I can observe that the specimen from Ñacuñan has the maxillary palpi with six segments and the labial palpi with two segments; the rest, from San Miguel the Tucumán, have six segments in maxillary palpi and three segments in the labial palpi (as in the original description).

Bionomics. The three specimens from San Miguel de Tucumán were bred from Cicadellidae Deltocephalinae nymphs.

Distribution. BOLIVIA: Río Itinez (Dpto. Beni); ARGENTINA: Urundel, Los Colorados (50 Km NE J.V. Gonzalez) (Salta province), La Higuerita (Dpto. Trancas – Tucumán province), Sumalao (Catamarca province), Loreto (Misiones province), Santa Catalina, Bella Vista (Buenos Aires province) (Olmi, 1984; Virla & Olmi, 1998). The study of specimens bred by the author and received to study, permit to enlarge the distribution of this species in Argentina to Ñacuñan (Mendoza province) and San Miguel de Tucumán (Tucumán province).

Material studied. ARGENTINA. Mendoza province: Ñacuñan (Sta. Rosa), 6-XI-1996, G. Debandi col., 1♀; **Tucumán province**: San Miguel de Tucumán, 22-X-1997, Virla col., 1♀; San Miguel de Tucumán, 22-X-1997, Virla col., 2♀♀.

Gonatopus flavoides (Olmi) group
(*sensu* Olmi 1993)
Gonatopus lauti Virla

Gonatopus lauti Virla 1997b: 8

Bionomics. The original description refers that this species has "Delphacidae" as hosts. A posterior study on the host mounted with the holotypus, made by Dra. Ana Marino de Remes Lenicov (Museo de La Plata, Argentina), reveal that it were the cosmopolitan planthopper *Toya propinqua* (Fieber). In this contribution is mentioned for the first time as hosts the planthopper *Delphacodes kuscheli* Fennah (Hemiptera: Delphacidae).

Distribution. Argentina: San Pedrito (Salta province), Bella Vista (Buenos Aires province), Loreto (Misiones province), Fontana (Chaco province) (Virla 1997b) and now enlarged to: Río Cuarto and Sampacho (Córdoba province).

Material examined. ARGENTINA. Córdoba province: Río Cuarto, 4-XII-1997, E. Virla col., 3♀♀, ex *Delphacodes kuscheli* Fennah (♀♀); Sampacho, 3-XII-1997, E. Virla col., 2♀♀, ex *Delphacodes kuscheli* Fennah (♀ and nymph); Sampacho, 3-XII-1997, E. Virla col., 1♂, ex *Delphacodes kuscheli* Fennah (♀).

Gonatopus testaceous Cameron group
(*sensu* Olmi 1993)
Gonatopus fritzi (Olmi)

Apterodryinus fritzi Olmi 1992a: 114

Gonatopus fritzi (Olmi): Olmi 1993: 78

During 1997 and examining the collections made by Dr. A.A. Ogloblin (at the "Museo de Cs. Naturales" La Plata, Buenos Aires), I have the possibility to study a specimen from Córdoba province (Virla & Olmi, 1998); recently Dr. Sergio Roig-Juñent sends me some materials that corresponded to this species. Their study allows me to mention certain morphological variations that I consider important to enrich the original description carried out by Olmi (1992a).

Description of female variations. Length 3.72 to 4.85 mm.; head reddish-testaceous or dark brown with sides of clypeus testaceous; antennae as described for the holotypus or testaceous with segments 9-10 whitish; pronotum with brown nuances near the disk; scutum brown or reddish-testaceous with a single medial longitudinal keel, or this keel plus two incomplete keels at each sides; enlarged claw with a subapical tooth and a row of 6 to 11 lamellae and 1 bristle; segment 5 of front tarsus with two rows of approximately 19 to 33 lamellae; distal apex with a group of at least 28 lamellae.

Distribution. Argentina: Moreno (Buenos Aires province) (Olmi 1992b), Los Reartes (Córdoba province) (Virla & Olmi, 1998), and now, the distribution is enlarged to Ñacuñán, (Sta. Rosa – Mendoza province).

Material examined. ARGENTINA. Córdoba province: Los Reartes, 1-XII-1941, A. A. Ogloblin col., 1♀; **Mendoza province:** Ñacuñán (Sta. Rosa), 6-XI-1996, G. Debandi col., 2♀♀, from *Atriplex lampa* Guillies ex Moq. "Zampa"; Ñacuñán, 12-I-1997, S. Lagos col., 1♀.

Remarks. *Gonatopus contortus* and *G. fritzi* are the first species of Dryinidae known for Mendoza province.

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